Connecticut Department of Environmental Protection

citizens' bulletin

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Spring Returns To Wetlands (p.9)

Male Red-Winged Blackbird/G. Sharp

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Salmon Restoration Program Update

Returning Salmon Spawn

Another major hurdle has been cleared in the effort to restore Atlantic salmon to the Connecticut River. A male and female salmon captured on their return to the river last summer have spawned successfully.

"As far as we know, this is the first time in more than 100 years that salmon have come back to the river and spawned," according to Cole Wilde, DEP Chief of Fisheries.

The fish were mated in November and the spawning produced 8,000 eggs. In addition, the Connecticut male was used to fertilize 21,000 eggs produced by four female Penobscot River salmon.

Late in January more than 90% of the eggs from both spawnings hatched, producing two new strains of Connecticut River salmon. Researchers hope these fish will have a strong urge to return to the Connecticut River Basin after they have been out to sea.

The offspring are currently being kept in an indoor trough at the Berkshire National Fish Hatchery. They will be released when they grow to smolt size, which should be by the spring of 1979. At present, the young fish are still utilizing their yolk sacs for food. Dry starter feed is being introduced to their tanks in anticipation of the day when they will be independent of the yolk sacs.

The parents of the new strain have been transferred to the New England Aquarium in Boston, where they will overwinter with other salmon under a regime designed to induce their return to maturity. If the process is successful they will be used for a second spawning this fall.

Photo by Jane McWhorter

U.S. Fish and Wildlife Service hatchery biologists fertilize Penobscot River salmon eggs with milt of male Connecticut River Atlantic salmon captured at the Holyoke Dam fishlift.

Reward Program Continues

According to Deputy Commissioner Theodore B. Bampton, rewards will again be offered in 1978 by the Connecticut River Anadramous Fisheries Restoration Program for the return of adult Atlantic salmon found in the Connecticut River or its tributaries.

A reward of $100.00 will be given for a live adult salmon and $25.00 for an adult salmon, which is found dead, killed in the process of capture or does not survive long enough to be transferred to a DEP official. The rewards are available to fishermen who turn in their catch to representatives of the Connecticut DEP.

"Live salmon that have successfully returned to the river are of vital importance to the restoration program," Bampton said. "They are needed to develop a run of Atlantic salmon with the necessary genetic characteristics to ultimately establish a Connecticut River strain of Atlantic salmon."

During 1977, seven Atlantic salmon are known to have returned to the Connecticut River. Three were taken in the Salmon River by recreational fishermen, one in the Connecticut River by a commercial shad fisherman and two at the Holyoke fish lift. A single salmon was found dead above the Holyoke fishway. Two of the fish taken in the Salmon River were turned in alive and earned the anglers the $100.00 reward.

Spawning of two of the returned fish has produced 8,000 fry which represent the first true Connecticut River Salmon since the early 1800s.

"We hope these reward payments will provide an incentive to fishermen who happen to be lucky enough to catch a salmon and keep it alive until a conservation officer or biologist can be contacted. Reward payments will be processed upon verification or after the fish is accepted alive and in good condition for transfer to a hatchery by a member of the DEP staff," Bampton noted.

The telephone numbers of DEP personnel are listed in the 1977-78 Hunting Trapping and Sport Fishing Abstract of Laws and Regulations available from any town clerk's office.

Pac Supports CBIA Lawsuit

DEP Commissioner Stanley J. Pac has expressed support for the efforts of the Connecticut Business and Industry (CBIA) to convince the U.S. Environmental Protection Agency (EPA) that it should take a regional approach to air pollution problems.

On March 16 CBIA and the New England Legal Foundation (NELF) announced their intentions to bring suit under the federal Clean Air Act against the U.S. Environmental Protection Agency and the environmental protection departments of New York and New Jersey.

"By virtue of Connecticut's position downwind of New York and New Jersey, this state daily inherits air pollutants which represent a health hazard to our citizens, frustrate our efforts to meet mandated clean air standards and threaten our economic growth," said CBIA President Arthur L. Woods in announcing the suit.

Commissioner Pac said he agreed with Woods' analysis of the problem and added, "the federal government must adopt a regional approach to the Northeast's air pollution problems, particularly automotive air pollution."

"We recognize," Pac said, "that Connecticut itself is responsible for generating automotive air pollution in quantities sufficient to drive us over the allowable federal health standards. That, however, only represents half of the problem. We are attempting to address our half of the problem through such proposals as an annual motor vehicle inspection and maintenance program which is now before the General Assembly.

"What we need now is a commitment from the federal government that it will use its power to eliminate the substantial quantities of air pollution which flow into and are measured in Connecticut."

He also urged EPA to end its practice of allowing relaxation of sulfur oxide standards for power plants in neighboring states.

"Connecticut has maintained a .5 percent sulfur standard for fossil fuel burning sources for more than five years. This regulation has been our single most successful tool in cleaning up what previously was a serious industrial air pollution problem.

"We have received excellent cooperation and compliance from Connecticut industry," Pac said, "and now it is time for EPA to help us by tightening up on the sulfur emissions in surrounding states. Our industrial sector should not have to suffer the competitive disadvantages caused by laxer standards in other states, and our citizens should not have to tolerate the added air pollution burden."

Letters of intent to sue were mailed to the U.S. Environmental Protection Agency (EPA) Administrator and EPA's Region II Administrator and the Governors and the heads of environmental protection departments in New York and New Jersey.

Those cited in the suit, EPA and the departments, will have 60 days in which to respond before legal action is filed with the U.S. District Court.

"It is our intent to force EPA to be more regional in their regulation of air pollution and to force New York and New Jersey to better control their sources to alleviate the interstate transport to Connecticut and other New England states of ozone, particulate and sulfur dioxide pollutants," said NELF Staff Attorney Wayne S. Henderson.

"The scale of the interstate flux is such that if Connecticut were to simply shut down tomorrow it would still be in violation of federal clean air standards for ozone by virtue of that which is blown into this state from New York and New Jersey," Henderson said.

Under the Clean Air Act of 1970 dates were established for the attainment of air quality standards. However, sources are regulated with respect to their effect on standards within a political body, and without concern for their effect on neighboring states.

In July, 1976, EPA issued notice that the New York and New Jersey plans for attainment were inadequate. The states were given until July, 1977 in which to file revised plans, but the deadline was not met.

In 1977 Congress reset dates for submission of revised plans and for attainment. The current deadlines are January 1, 1979, for submission of revised state implementation plans and December 31, 1982, for attainment of standards.

DEP Citizens' Bulletin

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Plan of C&D Revised

Fifteen public hearings are scheduled in late April, May and June on the Office of Policy and Management's (OPM) proposed Conservation and Development Policies Plan.

The 1979 revision of the original 1974 Plan of Conservation and Development proposes a framework of conservation and development goals to be adopted by the General Assembly. The goals are backed up by policies, priorities and guidelines to insure that state actions are directed toward achievement of long range goals. The proposed 1979 revision includes a map of the state which graphically illustrates how the policies relate to the state's land base.

The Plan is a legislative policy proposal which emphasizes setting directions and priorities for present and future actions of state government. It is not a plan for specific public facilities or a specific plan of land use for a long range future date or projected population and economic base.

Once the legislature adopts the final Policies Plan, OPM will begin a monitoring, review and advisory reporting process with respect to specific state actions. State agency plans and project proposals involving land acquisition and improvements which influence the location, timing, form and intensity of development and conservation will be reviewed to identify the extent of conformance, conflict and tradeoff with the adopted policies. The review will produce an advisory recommendation for the decision-maker in the agency sponsoring the specific proposal.

Following is a list of the proposed goals and policies. A schedule of public hearings appears on the Supplement.

Population and Human Development

Goal

To provide all citizens with an environment of fairness and equality of opportunity in pursuit of personal freedom to determine the direction of their lives.

Policies

1) To enhance the total environment in a way which provides to all citizens maximum choice and opportunity for human development.

2) To reduce concentrations of poverty and improve upon the ability of the poor to secure employment.

3) To insure that positive human development is a primary element of consideration in all conservation and development policy formulation and execution.

Economic Development

Goal

To establish and maintain a strong and expanding economy adequate to insure meaningful employment for all who seek it.

Policies

1) To strengthen, modernize, stabilize, and diversify the economy of the state through the attraction of needed private investment and through state public expenditures in areas identified by state economic planning as major state economic development needs or long-term opportunity areas.

2) To provide, through state programs, incentive and support for the location of large-scale, regionally significant employment concentrations into Urban Centers and Urban Growth Areas as designated. To support locally significant economic growth within Urban Centers, Urban Conservation Areas, Rural Community Centers and Urban Growth Areas as designated.

3) To manage state government activities (delivery of services, development and operation of facilities, raising of revenues, exercise of regulatory responsibilities and confidence in fiscal stability of government) in an efficient and far-sighted manner in order to contribute to a favorable climate for attracting economic growth.

Energy Resources

Goal

To assure sufficient supplies of energy to support a viable economy and a reasonable quality of life for all Connecticut citizens by giving even-handed attention to:

the availability and price of energy imported into the state;

energy supplies which can be obtained from local renewable energy sources;

the wise and efficient use of energy.

Policies

1) To vigorously avoid serious dislocation of the economy, institutions and households of the state and to insure

fairness and equity in the allocation of available energy and in the sharing of costs of all types associated with the period of energy shortage and uncertainty.

2) To increase the efficiency of energy usage in terms of output per energy unit.

3) To reduce the high level of petroleum use and dependence in the transportation sector.

4) To support research and development into availability and applicability of alternate energy sources such as solar, wind, wood, coal, nuclear and solid wastes and the consistency with considerations of public health and safety and maintenance of environmental quality.

Transportation Services

Goal

To provide an integrated, efficient and economical transportation system of modes which provides choice mobility, convenience, safety and meets the needs of all citizens, including transit-dependent and handicapped.

Policies

1) To decrease peak hour traffic volume and the degree of dependence upon energy and air quality inefficient automobile usage for home to work travel.

2) To develop a public transportation level of service which serves the basic needs of all segments of the population.

3) To insure that public investments in transportation system design, expansion and operation provide affirmative support to implementation of the range of state growth policies and public investment guidelines set forth in this Plan in areas of energy, air quality, urban development, land and water preservation and conservation and economic development.

4) To continue support of the development of a viable rail-freight system which meets the needs of the state and is fully coordinated with rail passenger needs.

Air Quality

Goal

To establish and maintain a quality of air which is healthy, visually unobtrusive and consistent with economic and urban development goals.

Policies

1) To attain and maintain national air quality standards and prevent significant degradation of high quality air resources.

2) To reduce air pollution emissions through the best available control technology, efficient operation, maintenance and inspection of pollutant sources as the need is identified through air quality implementation and maintenance planning.

3) To give priority to reduction of per capita emissions in the transportation sector by reducing travel distances, travel time and increasing vehicle occupancy rates.

4) To institute air quality information programs to educate the public as to the hazards of air pollutants and the means for attaining required air quality standards.

Housing

Goal

To establish an adequate supply of decent and affordable housing in a suitable living environment for all citizens and to provide an expanding opportunity for variety and choice in the selection of life styles.

Policies

1) To guarantee equal opportunity in housing.

2) To provide an adequate supply of housing at a lower cost and provide consumers with a choice of housing type, style, quality and location.

3) To provide housing in proximity to jobs and public facilities.

4) To support housing development that accommodates natural environmental limitations, values and considerations.

5) To establish an effective statewide housing program and planning process.

6) To preserve existing residential neighborhoods and existing housing stock.

Food Production

Goal

To maintain a long-term, in-state food producing capacity through the conservation and preservation of prime agricultural lands and through removal of disincentives to the continuation and expansion of food producing agriculture.

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Policies

1) To affirmatively influence urban development away from major concentrations of prime agricultural lands.

2) To avoid actions which directly or indirectly support the conversion of key agricultural lands to urban uses.

3) To support maintenance of lands in active food production.

4) To take timely public action to secure adequate prime agricultural land resources for future needs as these are threatened by pressures of conversion to urban development.

Water Supply

Goal

To establish and effectively manage sufficient high quality water supply sources to meet future supply needs.

Policies

1) To officially designate potential sources of adequate waters to meet long term future needs and to establish water quality protective measures adequate to insure meeting of public drinking water standards when used for public supply.

2) To insure that appropriate, timely planning and action is taken to avoid conditions of public water supply shortage, of substandard quality, which poses a threat to public health, or of excessive cost of water to the public.

3) To encourage and support conservation and increased efficiency in the use of public water supplies and elimination of practices wasteful of water resources, and to insure equitable allocation of costs and benefits associated with the provision of a high-grade public water supply system.

Wastewater Management

Goal

To restore the surface waters of the state to a quality consistent with its use for the protection and propagation of fish, shellfish and wildlife and with its use for recreation in and on the water.

To maintain existing high quality waters (presently better than the established standards), unless and until it has been affirmatively demonstrated that a lowering of quality is justifiable as a result of necessary economic or social development and will not interfere with or become injurious to any assigned uses made of, or presently possible in, such waters.

Policies

1) To affirmatively support the focusing of new economic growth and urban development or redevelopment in areas which have the greatest suitability and opportunity for maintaining or achieving water quality standards.

2) Discourage in rural areas urban development at densities which cannot assure indefinite functioning of on-lot wastewater disposal facilities.

3) Continue to improve the quality of surface and groundwater through eliminating the discharge of unreated pollutants; through support of development of new technologies and practices for pollution abatement, waste treatment and recycling; and through support of appropriate land use management.

Land and Water Resources

Goal

To enhance the quality of the physical environment by the conservation and preservation of natural and cultural resources and ecological systems in accordance with the state's general environmental policy framework.

Policies

1) To identify and to protect the significant and critical environmental areas of the state for the benefit and enjoyment of present and future generations.

2) To encourage scientific forest management of forest land.

3) To provide a wide variety of high quality outdoor recreation opportunities to all citizens with highest priority given to purchase and development of facilities in and near urban areas.

4) To evaluate all activities which may adversely affect critical areas and undertake measures to minimize detrimental effects.

5) To establish a state first option for purchase, in fee simple or of development rights, of land to be preserved and to establish flexible revolving funds to assure timely exercise of this option when appropriate. Incorporate provision for public management and resource development, sale for lease-back for uses compatible with environmental and public resource needs.

For copies of the proposed Conservation and Development Policies Plan, write Office of Policy and Management, 340 Capitol Avenue, Hartford, Connecticut 06115.

For Your Information

By Ellen Frye, Citizen Participation Coordinator

Legislative Update

Bottle Bill Passes

After years of trying, supporters of the controversial "Bottle Bill" have succeeded in gaining its passage in both the House and the Senate.

There have been a few amendments to the bottle bill since it was discussed in the last issue of the Bulletin. One important change is the date on which the bill will take effect. Originally shceduled for January 1979, the Act will now become effective as of January 1, 1980.

The other major amendment provides for an "employee dislocation allowance fund" to be administered by the labor commissioner. This would compensate employees who lose jobs as a result of this Act. The amendment includes provision for reemployment assistance such as retraining or relocation allowances for those affected by the Act.

What does the bottle bill mean to Connecticut consumers of beverages?

The following is a list of the bill's major features:

1. Every beverage container sold in the state will have a refund value of no less than five cents.
2. If a dealer sells a certain kind, size, brand or shape of beverage, he or she cannot refuse to take it back for a refund. However, a container returned with material different from what is supposed to be in the container need not be accepted by the dealer. A redemption center within a one mile radius of the dealer will enable the dealer to avoid the redemption requirement.
3. Any person may establish a redemption center.
4. The refund value must appear on all containers sold in Connecticut.
5. Beverage cans will no longer have detachable openers.

As a result of this legislation, more bottles than cans may appear on the market, because a nickel deposit on a can may not be economical for the distributor or dealer.

Consumers should plan now to develop a method for saving returnables. Changing habits now may save money later by overcoming what may have become a reflex of throwing empty containers into the trash can. Beginning a household recycling program is one method of preparing for the change which will help conserve resources.

Sewer Avoidance Bill

Connecticut towns may get new tools to provide flexibility in local land use planning and development if the legislature adopts the recommendations of a recent DEP report and passes House Bill 5840.

The report, titled "The Establishment and Administration of a Municipal and Town Sewer Avoidance Program," was prepared to comply with Special Act 77-31 which requested the Commissioner to prepare recommendations for establishing and administering voluntary municipal sewer avoidance programs.

House Bill 5840 was voted favorably by the Environment Committee, was passed by the House on March 31, and was then sent to the Senate. The bill amends several statutes relating to the planning, funding and administration of municipal sewerage facilities.

The major change proposed by the amendments is to broaden the responsibility and authority of local officials to control water pollution problems. The term sewer authority is replaced throughout the water pollution statutes by the term water pollution control authority to reflect the expanded scope of responsibility for these local agencies.

Under the terms of the proposed bill, the local water pollution control authority would be responsible for preparing a water pollution control plan for the municipality. In its planning, the local authority could consider existing land use plans. Perhaps the most important change is that the water pollution control authority would be expected to consider all methods of treatment currently available to develop a blueprint for municipal water pollution control. Historically, sewer authorities have restricted their activity to considering sewers.

The legislation also encourages the installation by developers of small, onsite community sewage disposal systems and requires the water pollution control authority to ensure the effective manage-

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ment and operation of privately built community systems. This provision would eliminate a major impediment to small community system construction by guaranteeing that a public body would stand behind the project.

Recent changes in the federal Clean Water Act make grants available for up to 75% of the cost of such privately constructed on-site systems when built to solve existing pollution problems.

The net effect of these proposed changes is to give Connecticut municipalities greater flexibility in making development decisions. At the present time, housing alternatives are effectively limited to those served by individual septic systems or large-scale centralized sewers. The bill would provide for solutions, such as on-site treatment systems, to serve an entire neighborhood or a high density housing project. In this way, the bill should offer towns broader options in meeting the housing needs of our citizens.

CAM Watered Down in Committee

The proposed legislation submitted to the General Assembly by the Connecticut Coastal Area Management Advisory Board emerged from the Environment Committee considerably altered from its original form. The Committee recognized the importance of the coastal area and the need for preservation, management and wise use of coastal resources, but the ensuing sections of the revised bill called only for further study of the situation.

The Commissioner of Environmental Protection is required to prepare a report which would include guidelines for managing the CAM program by September 1, 1978 for submission to the Environment and General Law Committees. A nine member interim study committee is also to be appointed to submit a report to the General Assembly by January 1, 1979. The report will include recommendations for legislative action for the CAM program.

The amended bill essentially extends the study activity which has already been underway for the past three years and delays action on Coastal Area Management. The definitions, goals and policies submitted in the proposed legislation were the only sections left relatively intact.

Agricultural Land Preservation

The subject of agricultural preservation is still with the finance committee. It is difficult to speculate on the direction the committee will take, because there are currently at least 5 proposed bills dealing with the use of agricultural lands.

Litter Bill

The Litter Bill has passed the Senate and has yet to be voted on by the house. This bill addresses the litter problem through a government clean-up program. It provides for little or no enforcement power. It would provide manpower to pick up other people's garbage and seek to educate the public on the virtues of neatness and conservation.

Inspection and Maintenance

The Inspection and Maintenance Bill is still in the appropriations committee and has not been addressed by either house of the General Assembly.

Other Bills of Interest

Increasing the Qualification Requirement For Resident Hunting and Fishing Licenses, HB 5539.

This bill, which has passed in the House, changes the qualification requirement for resident hunting and fishing licenses to make Connecticut's requirements comparable to those of other states. Nonresidents of the state will be required to own ten thousand dollars ($10,000) or more of improved real estate in this state to procure a license for the same fee as a resident, rather than the current one thousand dollars ($1,000).

The Killing of Dogs Pursuing Deer, HB 5506.

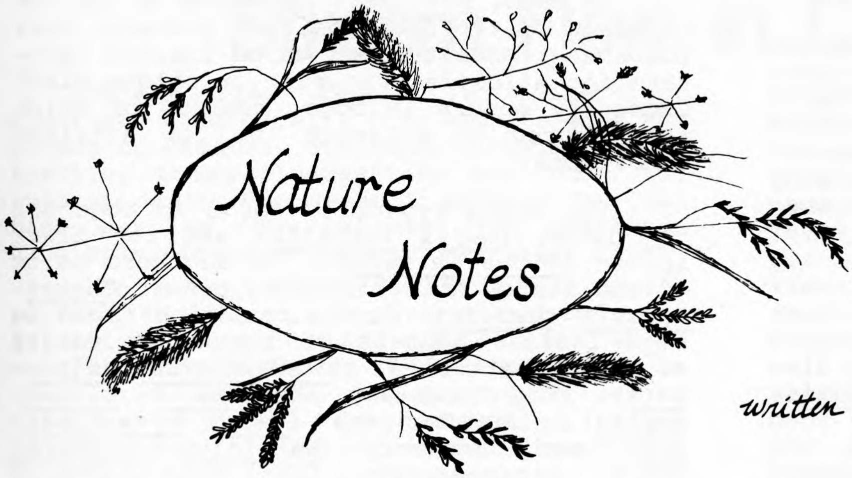
In addition to those listed in the statutes as qualified to kill dogs "worrying" or pursuing deer, a local police officer, local dog warden or constable would be qualified. This amendment has passed the House.

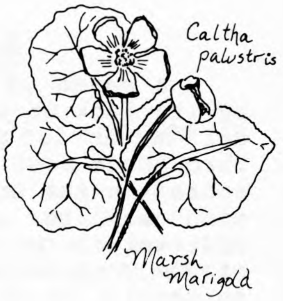
Contracts Between Municipalities And Engineering Consultants, HB 5739.

The commissioner of DEP may be a party to a contract between a municipality or municipal agency and an engineering consultant which concerns waste water treatment or study, if the contract involves a grant for design or construction for which state monies would be allocated or for which the state would disburse federal funds. This bill, which is meant to protect municipalities from excessive engineering fees, has passed the House.

Commuter Parking Facilities Along Rail, Bus And Auto Routes, HB 5099.

This bill, which has passed the House, is meant to divide funds for parking facilities for commuters who travel by railroad, bus or automobile more equitably in hopes of encouraging greater use of mass transportation facilities.





written and illustrated by Penni Sharp

Spring Is Early in Freshwater Wetlands

Among the first sounds to herald the arrival of spring are the chorus of spring peepers and the "conk-a-ree" of the male red winged blackbird. Before the actual "greening" of the landscape, these sounds tell us that warmer weather and longer days are on the way.

Interestingly, the habitat for both red wings and peepers is a marsh or swamp, and it is these areas that are first to be released from winter's grip. In Connecticut, the earliest wildflowers to bloom -- skunk cabbage (Symplocarpus toetidus) and marsh marigold (Caltha palustris) -- are inland wetland species. The shrubs associated with wetlands such as pussy willow (Salix discolor) and spicebush (Lindera Benzoin), also flower early. Spring, the season of high water, is the prime time for freshwater wetlands.

What Is A Freshwater Wetland?

In general, a freshwater or inland wetland is an area characterized by poorly drained or alluvial soils. Throughout much of the year, the watertable is at, or above, the surface level, and the area is subject to seasonal flooding. There are three basic types of inland wetlands -- swamps, marshes or bogs. The three types differ in their hydrologic budget and the type of vegetation that is present. While there are many gradients within each group, certain characteristics prevail which are common to all subtypes within a group.

The Swamp

The swamp is characterized by woody vegetation. Typically, in Connecticut, red maple (Acer rubrum) is the dominant tree of the swamp; however, tupelo (Nyssa sylvatica) and black ash (Fraxinus nigra) may also be present. Swamp white oak (Quercus bicolor) is another tree species that may occasionally be found in Connecticut swamps. In swamps dominated by trees, an understory of particular shrubs develops. Included are spicebush (Lindera benzoin), pepperbush, (Clethra alnifolia) and highbush blueberry (Vaccinium corymbosum). These shrubs are important wildlife foods, and for those who wish to try something different a tangy tea can be brewed from the twigs of spicebush.

Anyone who has walked through a swamp is undoubtedly familiar with the tussock sedge (Carex stricta), which grows in hummocks and provides a tentative foothold for one attempting to keep feet dry. Other low growing plants include skunk cabbage, marsh marigold, violets (Viola sp.) and jewelweed (Impatiens sp.).

Some swamps are dominated by shrubs, and in these, alders (Alnus sp.), willows (Salix sp.), and buttonbush (Cephalanthus occidentalis) prevail. Wetlands dominated by these shrubs often have a high watertable which favors the growth of shrubs over trees.

Of the wetland types, swamps probably have the richest diversity of animal life. A great number of bird species can be found in wooded swamps. Waterfowl, such as wood ducks (Aix sponsa), mallards (Anas platyrhynchos), and black duck (Anas rubripes) nest in swamps. A visit to a swamp during the warbler migration attests to the great variety of these and other songbirds that are attracted to the swamp habitat.

Here, birds find abundant food in the form of insects and plenty of cover for protection from predators.

Swamps provide habitat for many species of mammals including deer, opossum, cottontail rabbits and raccoon. Again, the attraction is the food source and cover that is readily available in the swamp environment.

The Marsh

A marsh is distinguished from a swamp by its lack of woody vegetation. The typical marsh is covered with shallow water throughout most of the year, with vegetation rooted in the underwater soil. The vegetation may be either submergent (growing underwater) or emergent (growing with most of the vegetative portion above the water surface).

Of the emergents found in marshes, cattails (*Typha* spp.) are probably the most familiar, although in many marshes, especially those which have been subject to disturbance, common reed (*Phragmites communis*) is abundant. While cattails are rich food resources for birds and small mammals, the reed is of little value in this respect. Less common is the occurrence of wild rice (*Zizania aquatica*) another emergent species.

Other distinctive marsh plants are pickerel weed (*Pontederia cordata*), arrow arum (*Peltandra virginica*) and arrowhead (*Sagittaria latifolia*). These three plants share a superficial resemblance to each other in their arrow shaped leaves, but can be told apart by the leaf bases. Pickerelweed has leaves with a heart shaped base, arrow arum has blunt basal lobes, while those of arrowhead are long and tapering.

Sedges (*Carex* sp.) and rushes (*Juncus* sp.) are common plants of the marsh. A plant which emblazons the marsh with a brilliant magenta hue during mid to late summer is the purple loosestrife (*Lythrum salicaria*). Unfortunately this plant, although pretty, is an introduced species and is replacing native vegetation as it spreads through marshes. Like *Phragmites*, it has little food value for wildlife.

Submerged plants that may be present in marshes include: pondweeds (*Potamogeton* spp.), water milfoil (*Myriophyllum* sp.) and waterweed (*Elodea* spp.).

The marsh is an important habitat for waterfowl which feed, mate, nest, and raise their young there. In addition, ducks and geese use marshes as resting places during migration. These wetlands are also valuable habitats for wading birds like egrets, bitterns and herons.

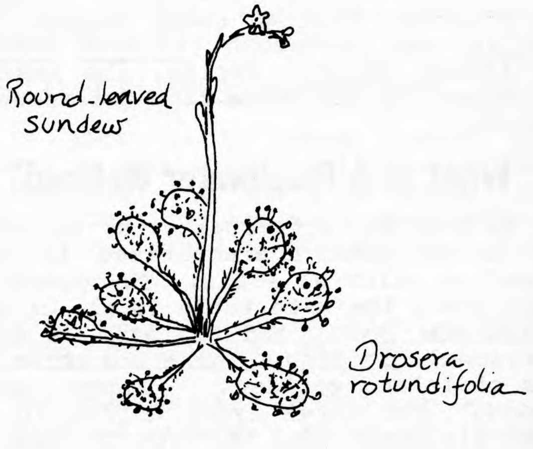
The Bog

The bog is perhaps the most interesting wetland type for its geological and botanical features. Bogs have frequently developed over former glacial lakes which are characterized by minimal outflow. The poor drainage leads to acid conditions in which decay proceeds very slowly. Low oxygen levels and cool temperatures cause organic matter to accumulate. Peat mats are formed by the accumulation of sphagnum moss and these mats spread outward from the shore ultimately covering the water surface. Deposits of peat can reach considerable depth...up to 40 feet in some cases!

In bogs, nutrients are bound up and not released by the decomposition process, thus these environments tend to be limited habitats for wildlife. However, a unique plant community occurs in bogs, members of which are adapted to tolerate the low nutrient conditions.

The trees typically found in bogs are the larch (*Larix laricina*) and the black spruce (*Picea mariana*). In southern parts of the state, Atlantic white cedar (*Chamaecyparis thyoides*) occurs. Shrubs found in bogs include members of the heath family such as leatherleaf (*Chamaedaphne calyculata*), bog rosemary (*Andromeda glaucophylla*), labrador tea (*Ledum groenlandicum*), and cranberry (*Vaccinium oxycoccos* and *V. macrocarpon*).

The herbaceous species found in bogs include two insectivorous plants, the sundew (*Drosera rotundifolia*) and the pitcher plant (*Sarracenia purpurea*). The sundew exudes a sticky secretion which entraps insects for the plant to digest, whereas the pitcher plant attracts insects by the coloration of its pitcher shaped leaves. The leaves are partly filled with water and the unwary insect drowns and is digested by the plant. The evolution of the insectivorous habit has allowed these plants to tolerate a low nutrient environment. They receive the necessary proteins and elements directly from the insects which they digest.



Conclusion

Wetlands are specialized habitats which form a variety of functions -- wildlife habitat, flood control and pollution filtration, to name a few. Fortunately, the General Assembly has provided for the regulation of development in inland wetlands so that these valuable and interesting areas may continue to perform their natural functions in our ecological system.

This month put on some rubber boots, visit a wetland in your area to see for yourself some of the unique plants and wildlife species that make their home in a freshwater wetland.

Stream Flow in Connecticut

Stream flow levels in Connecticut fluctuate dramatically from week to week and season to season. The general factors controlling these fluctuations are often not understood by the general public, but the high and low flow extremes can sometimes have significant effects on our daily lives.

Monitoring of stream flow is an important tool used in water management to determine current and potential water availability. Stream flow monitoring is also used for the management of water quality, for the forecasting of water hazards, and for the surveillance necessary to comply with legal requirements.

To understand why there are such wide stream flow fluctuations, we need only look at two very simple processes that go on throughout the year. Total yearly precipitation in Connecticut usually falls some place between 45 inches and 50 inches with a fairly consistent 4 inches of rain per month throughout the year.

During the plant growing season of about six months, two inches of water is returned to the atmosphere through direct evaporation from the land surface and transpiration from green plants. The two processes are collectively referred to as evapo-transpiration. If, during a given month, total precipitation drops to three inches from the average of four inches per month, the evapo-transpiration processes still return two inches of water to the atmosphere leaving only one inch of water available for stream flow instead of the normal two inches. This change from four inches to three inches of total monthly rainfall, which is not uncommon, is a 25% decline, but because of the constant evapo-transpiration loss the one inch total change in rainfall results in a 50% reduction in stream flow.

During the winter period transpiration does not play a part in this system and the amount of evaporation is relatively small as compared to the summer season. However, precipitation, whether it be at a rate of three, four, or five inches a month, tends to accumulate and be stored in the form of ice and snow. The water stored in this form is periodically released during warm weather breaks.

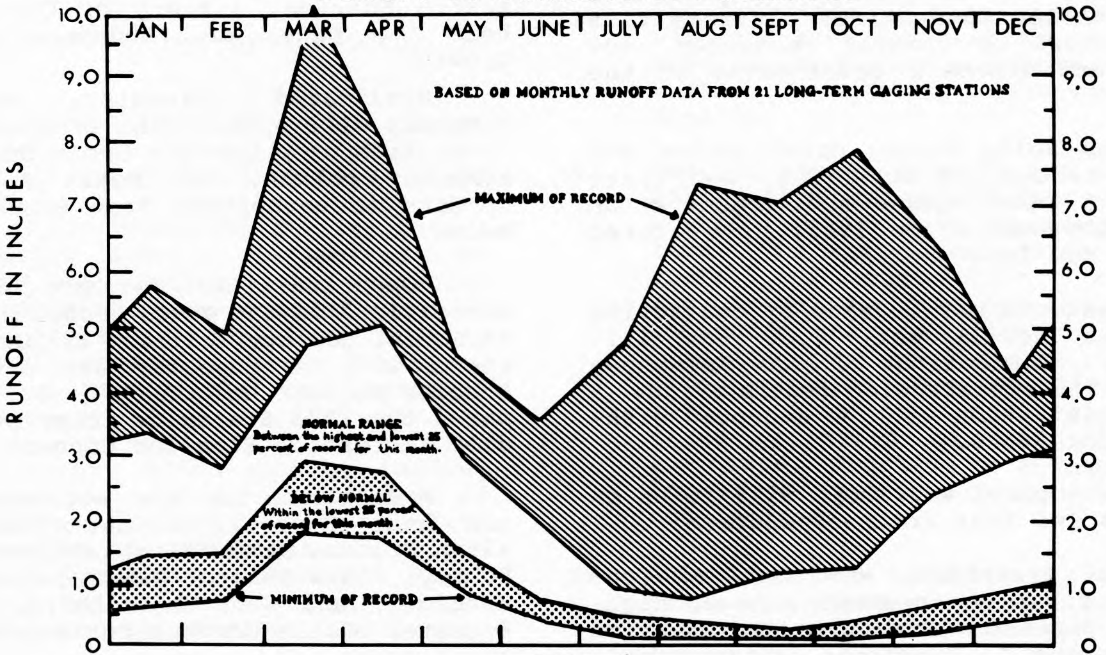
Because the ground is frozen at this time of the year, melt waters and rainfall flow over land more directly to nearby watercourses resulting in higher stream flows. Once melting ceases or the rain stops, stream flow levels gradually drop back to the original lower level.

One method used to show stream flow fluctuation and potential monthly variation is to measure and plot the flow levels over long periods of time in graph form. The graph below is based on the historical monthly runoff records from 21 long-term gaging stations scattered throughout Connecticut and reveals the ranges of stream flow observed. The gaging stations are operated by the U.S. Geological Survey in cooperation with the Connecticut Department of Environmental Protection as part of Connecticut's stream flow gaging network.

New Publication of Connecticut Hydrology

Map showing drainage areas, New Hartford Quadrangle; by Mendall P. Thomas and Robert L. White, U.S. Geological Survey Misc. Field Studies Map No. MF 542-C.

RUNOFF OF CONNECTICUT STREAMS



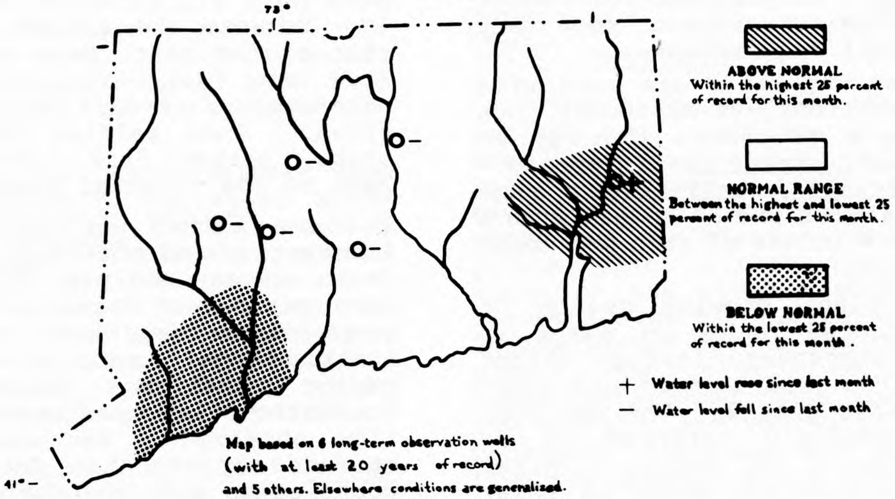
Summary of Water Resources Conditions for February, 1978

Cold weather and lack of precipitation reduced average monthly streamflow for February to 80% of median which is at the low limit of the normal range. Month-end flows averaged 55% of median, well below normal range. Cumulative runoff since October is now 210% of median.

Reservoirs of four principal municipal systems contained 100% of usable capacity at month end, the same as last month and 10% more than last year. Usable contents were 17% above average for end of February.

Groundwater levels in the key observation wells generally declined during February over nearly all of Connecticut, although they remained mostly above average. The levels were principally in the normal range except in Plainfield, where they were in the high range, and Fairfield, where they were in the low range.

Ground Water Storage: February, 1978


73°
41°
▨ ABOVE NORMAL
Within the highest 25 percent of record for this month.
☐ NORMAL RANGE
Between the highest and lowest 25 percent of record for this month.
░ BELOW NORMAL
Within the lowest 25 percent of record for this month.
+ Water level rose since last month
— Water level fell since last month
Map based on 6 long-term observation wells (with at least 20 years of record) and 5 others. Elsewhere conditions are generalized.

"Tomorrow" The Topic of Natural Resources Conference

"The Promise of Connecticut's Future" is the title of the Natural Resources Council of Connecticut, Inc.'s Conference, scheduled for May 17, 1978 at Restland Farms in Northford. The conference will show the critical choices Connecticut citizens face for the future of natural resources, environment and economic development in the state.

William Holly Whyte, noted author and nationally-recognized authority, who first defined the open space and conservation needs of Connecticut in 1963, is featured during the day-long program.

Reservations may be made by contacting Mrs. Richard McCallister, P.O. Box 151, Bridgewater, Connecticut 06752, Telephone 354-5004. The registration fee is $9.50. A limited registration will be accepted without lunch for $4.00.

Separate panel workshops will focus on the outlook for four areas of concern:

Russell Brenneman, who authored Connecticut's first environmental laws, highlights the panel on "Trends in Conservation and Development." Brenneman is now President of the Connecticut Resources Recovery Authority.

An analyst in futures research, William L. Renfro of the Congressional Research Service, Library of Congress, will head the panel on "Economic and Energy Growth."

Syndicated Columnist, Michael J. McManus, will present the prospects for the "Evolution of a Quality Urban Environment." McManus' column, "Northeast Perspective," appears in newspapers from Pennsylvania to Maine.

"Opportunities in Open Spaces and Recreation" is the panel headed by Professor of Social Ecology, William R. Burch, Jr., of the School of Forestry and Environmental Studies at Yale University. Dr. Burch prepared the 1973 Statewide Comprehensive Outdoor Recreation Plan for Connecticut.

Moderators for the workshop sessions are Anne Conover, Conservationist; Lynn Allen Brooks, former Commissioner of Energy Policy; State Senator Sanford Cloud, Jr. of Hartford; and John E. Hibbard, Secretary-Forester of the Connecticut Forest and Park Association.

208
WATER QUALITY MANAGEMENT

209 COURT ST., MIDDLETOWN, CT. 06457 347-3700
By Joseph M. Rinaldi, 208 Public Participation Assistant

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208 Groundwater Study

The U.S. Geological Survey (USGS) is currently under contract with the Connecticut 208 Program to perform a special study pertaining to groundwater. The USGS study is crucial because roughly 8% of all water use in Connecticut is supplied by groundwater, and, in certain instances, such as rural, domestic consumption, groundwater is the sole supply. Also, the overall percentage is likely to rise in the future, because as drinking water quality standards become more stringent, communities which now rely on surface water supplies may find it economically desirable to draw from groundwater rather than upgrade or build surface water treatment plants.

The USGS 208 Study performs two major functions. The first is the delineation of high-yield aquifers, which are underground layers of earth, gravel or porous stone that contain water in sufficient volume to be used for public or industrial supply. The second is the identification of areas where water quality is impaired, contaminated, or threatened with contamination.

Preliminary Findings

Preliminary findings by the Study are as follows:

1) All of Connecticut is underlain by aquifers. The most favorable for large-scale water supplies (high-yield aquifers) are extensive, thick deposits of course-grained, stratified drift (rock debris transported and deposited by glaciers) in hydraulic connection with large streams. Most of these aquifers are overlain by builtup urban and industrial areas and are, therefore, susceptible to contamination.

2) Surface water, which may be induced into aquifers under conditions of development, is impaired in quality along reaches of some streams, including the Pequabuck, Podunk, Park, Hockanum, Quinnipiac, Still, Naugatuck, and Norwalk Rivers, and Porter Brook.

3) Salty surface water along the coast and in estuaries has infiltrated aquifers as a result of overpumping of wells in the Long Island Sound coastal area including the cities of New Haven and Bridgeport and the Groton-Norwich area.

4) Individual septic systems in builtup, non-sewered areas throughout the State and in some rural areas where bedrock is shallow, are contributing increasing amounts of sodium, chlorides and nitrates to groundwater. As a result, concentrations of these constituents exceed Connecticut Department of Health standards for drinking water in many of these areas.

5) More than fifty (50) out of 554 incidents of spillage and seepage of fuel oil, gasoline and other hazardous substances reported in a one year period (July, 1976 - June, 1977) resulted in more than 44 thousand gallons of hydrocarbons reaching groundwater. Most cases involved leaky tanks. Nine of the incidents resulted in a loss of at least 1,000 gallons each.

6) Of 126 stockpiles of road salt maintained by the Connecticut Department of Transportation, 11 have caused groundwater contamination. A large number of town and private stockpiles exist throughout the State. Many salt piles have been eliminated, moved, or covered, but the residual salt-impregnated soil and impaired water may still cause problems.

7) Of 205 solid waste disposal areas authorized by the Connecticut Department of Environmental Protection, 14 are known to have degraded groundwater, and several others suspected of causing contamination are under study. The locations of many additional private and town disposal areas that were used in the past are unknown, but their wastes are still affecting water quality.

8) Leached wastes from 23 out of 335 reported sites of ground disposal of industrial wastes have caused contamination. The wastes include metals, solvents, and other organic chemicals. They travel downgradient and have contaminated wells as far as 9,000 feet from the site of disposal. Reported sites comprise about one-third of the total number of industrial disposal sites estimated to exist throughout the State. Inactive or abandoned sites for which records are unavailable are not included.

9) Animal wastes, fertilizers, and pesticides are thought to have less of an impact on groundwater than of urban and industrial origin. Although high

nitrate concentrations in some agricultural areas are attributed to agricultural practices. Improper handling and storage of chemicals occasionally causes problems.

10) The numerous incidents of contamination identified in the course of this study are believed to represent only a small proportion of the total. Only well-designed monitoring systems would determine the full scope of the problem of degraded groundwater in Connecticut.

Preliminary Conclusions

Although the natural quality of Connecticut's groundwater is very good, human activities have degraded this quality in all parts of the State. In most reported cases, the impairment affects only small local areas. If present practices continue, however, as population and development of the State increase, the number, areal extent and magnitude of plumes of degraded groundwater will also increase. The numerous sources of contamination tabulated in the course of this study are believed to be only a small proportion of the total.

Contaminated groundwater, unlike surface water, is unseen, slow to attenuate, disperse, or move out of the system and may remain undetected, but potentially harmful for years. Furthermore, once detected, a plume of degraded water may be physically or economically impossible to remove or improve in a realistic period of time.

Most of the groundwater contamination in Connecticut results from individual septic systems in builtup areas, leaks and spills of petroleum products, improper storage and high rates of application of road salts, disposal of solid wastes and industrial sludges, infiltration of contaminated or salty surface water, and use of fertilizers and pesticides. These have affected groundwater quality in parts of all aquifers throughout the State. Furthermore, the most intense development and industrialization is in valleys along major rivers, areas which are hydraulically connected to the most productive sand-and-gravel aquifers.

Unfortunately, those high-yield aquifers with the most favorable potential as future public and industrial water supplies are also the most susceptible to contamination and have already been stressed by human activities. A well designed surveillance system would serve to identify the scope of the problem and provide an early warning so that corrective action could be taken in the minimum amount of time. A surveillance system would also permit the development of appropriate management schemes to help protect these areas from additional stress.

Permits Issued

Air Compliance

December 14
Fitch Junior High School
Permit to construct 2 boilers in the Town of Groton.

December 29
Metalmast Marine, Inc.
Permit to construct a whitening tank, etch tank and anodizing tank in the Town of Putnam.

January 1
Ralston Purina Co.
Permit to operate a boiler in the Town of Franklin.

January 25
Pomfret School
Permit to operate a boiler in the Town of Pomfret.

January 31
General Dynamics Corp.
Permit to operate a boiler in the Town of Groton.

February 28
J.C. Penney
Permit to construct 4 boilers in the Town of Manchester.

Water Compliance

February 6
J.B.T. Switches
Permit, with conditions, to discharge treated plating rinse waters to the Long Island Sound watershed in the Town of New Haven.

February 17
Latex Foam Products, Inc.
Permit, with conditions, to discharge non-contact cooling water to the Housatonic River watershed in the Town of Shelton.

February 24
Barbara Monteroso
Permit, with conditions, to discharge treated wastewater to the Ponset Brook watershed in the Town of Haddam.

February 27
Reduction Associates, Inc.
Permit, with conditions, to operate and maintain a sanitary landfill with the resultant leachate discharge to the groundwaters of the state in the Pine Brook watershed in the Town of Colchester.

March 1
King Seely Thermos Company
Permit, with conditions, to discharge blowdown from a closed loop cooling system to the Shetucket River watershed in the City of Norwich.

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Permits Issued (Cont.)

Water Compliance

March 10
Brownell & Company, Inc.
Permit, with conditions, to discharge sanitary and dye wastewater to the Moodus River watershed in the Town of East Haddam.

March 10
Springborn Laboratories, Inc.
Permit, with conditions, to discharge 5,000 gallons per day of bottle washing wastewater to the Connecticut River watershed in the Town of Enfield.

March 10
Johnson Memorial Hospital
Permit, with conditions, to discharge treated sanitary sewage to the Pomeroy Brook watershed in the Town of Stafford.

March 10
Glendinning Companies, Inc.
Permit, with conditions, to discharge non-contact cooling water to the Saugatuck River watershed in the Town of Westport.

March 10
J & S Metals, Inc.
Permit, with conditions, to discharge non-contact cooling water to the Pequabuck River watershed in the Town of Bristol.

March 13
Stahl's Inc.
Permit, with conditions, to discharge vehicle servicing wastewaters to the Housatonic River watershed in the Town of Derby.

Water Resources

Encroachments

March 2
Town of New Milford
Permit to perform emergency stream bank restoration along the Housatonic River in New Milford upstream of the Bleachery Dam riverward of established stream channel encroachment lines.

March 6
Fairfield Investors, Inc.
Permit, with conditions, to widen and deepen the Norwalk River, place fill to form a parking area and construct a multistoried office building and parking structure riverward of established stream channel encroachment lines in the City of Norwalk.

Structures & Dredging

March 2
Harbor Valley Marina, Inc., No. SD-77193
Permit to retain and maintain approximately 315 lineal feet of riprap and timber bulkhead, concrete slabs, floating docks, finger floats, ramps, pilings and a travel lift pier in the Housatonic River at Shelton. Permit includes the right to maintain an existing dredged area of 50' x 250'.

March 2
Mary L. Oakes, No. SD-77197
Permit to install and maintain a pile and timber pier, floating dock structure with four supporting piles that will extend approximately 50' seaward at mean high water in the Connecticut River at Essex.

March 13
Sidney Berkowitz, No. SD-77194
Permit to retain and maintain an existing 30' pile and timber bulkhead in Pine Creek at Fairfield.

March 13
Leo L. Lieberman, No. SD-77196
Permit to place approximately 110 feet of riprap adjacent to a paved private right-of-way off Highway Point Lane in Waterford. The riprap will be placed 3' beyond mean high water to prevent further erosion.

March 14
John B. Bindloss, No. SD-77177
Permit to install and maintain a 410' by 12' and 260' by 12' pier extension with a 94' T-head and four dolphins in Stonington Harbor at Stonington.

Inland Wetlands

March 6
Simon Mendelson, No. 78-IW-185
Permit, with conditions, to conduct a regulated activity within inland wetlands and watercourses in the Town of Monroe. The work consists of crossing of wetlands and a watercourse with Simend Drive, the culverting of a watercourse under Simend Drive and the installation of a 4" P.V.C. sewer pipe through wetlands.

March 8
J. & D. Kasper & Associates,
No. 78-IW-188
Permit, with conditions, to conduct a regulated activity within inland wetlands and watercourses in the Town of Monroe. The work consists of a road crossing and culvert installation within inland wetlands and/or watercourses associated with a 15 lot development known as Woodland Commons.

March 15
George Frick, No. 78-IW-189
Permit, with conditions, to conduct a regulated activity within inland wetlands and watercourses in the Town of Columbia. The work consists of constructing a driveway across inland wetlands for access to a residential home site and constructing a home in which a minor portion will rest in wetlands.

Trailside Botanizing

by G. Winston Carter

Shadbush

(Amelanchier canadensis)

The shadbush with its pure white flowers is found in the early spring woods soon after the spicebush blossoms. The flowers appear high up on the shadbush a short time before the leaves.

The shadbush was given its name because it produces flowers at about the time that the shad are running in the rivers, from March to May. It is also called Juneberry, referring to the time of year it produces its delicious red or purple berries, and serviceberry because of the many uses that the Indians made of the berry in their cooking.

Amelanchier canadensis has fine-toothed leaves with tips that are mostly rounded. The bark is grey and smooth with faint streaks. Identification of shadbush is much more difficult than most of our common trees and shrubs because there are at least twenty different species, and it sometimes hydridizes which adds to the confusion.

Species of the genus Amelanchier are found in a variety of habitats. Amelanchier canadensus is found both in swamps and in old fields where conditions are dry. Some of our other Amelanchier species appear to be limited to rather dry situations. This would be true of Amelanchier arborea and Amelanchier laevis. All three species are found in Connecticut.

Each shadbush berry has ten seeds which are usually distributed by birds. The fruit is sometimes eaten by twenty-seven species of birds, including some of our common birds like the flicker, cardinal and robin, while the leaves and bark are eaten by many game animals. The wood of the shadbush is hard and has been used for tool handles, cabinet work and umbrella handles.

DEP citizens' bulletin

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

Commissioner: Stanley J. Pac
Director, Info & Ed: Greg Sharp
Layout: Rosemary Gutbrod
Typist: Linda Mrowka
Phone: 566-5524

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